MODIS Technical Team Meeting
Thursday, August 2, 2001
3:00 PM

Vince Salomonson chaired the meeting. Present were David Herring, Steve
Running, Bruce Ramsay, Wayne Esaias, Ed Masuoka, Chris Justice, Eric
Vermote, Barbara Conboy, Bob Murphy, Jacques Descloitres, Steve Kempler, and
Al Fleig, with Rebecca Lindsey taking the minutes.

1.0 Schedule of Upcoming Events
- ESIP Federation Meeting   July 24-26, 2001
  University of North Dakota, Grand Forks
- MODIS Science Team Meeting   September 24-26, 2001
  Location: BWI Marriott

2.0 Meeting Minutes
2.1 Presentations
        The first part of the meeting took place in H103, the E-Theater. Herring began by
introducing Reto Stockli, a Ph.D. candidate at the University of Zurich in Switzerland,
who is developing a new "blue marble," a global Earth representation made almost
entirely of MODIS products: surface reflectance, albedo, snow cover, sea ice, ocean
chlorophyll, and clouds. Herring indicated that this is part of the Earth Observatory's goal
of making their site a place where the media, museums, the public, etc., can come for
Earth Science visualizations from high to moderate to low resolution. He showed an
example from a museum in Tokyo that had built a 20-ft diameter sphere out of LED
displays on which they were displaying MOPITT carbon monoxide data set. The blue
marble, which he expects will become the new standard beauty shot of Earth, would be
used by museums like the one on Tokyo. In addition there are plans to use the
visualization at the upcoming Winter Olympics in Salt Lake City.
        Stockli presented the status of his work. He currently has the 1-km land surface
product in good shape. Eventually, he will produce a globe with 500-m resolution Land
surface data. He pointed out some problems with cloud cover that were apparent despite a
two-month composite, as well as possible aerosol contamination. But overall it looks very
good. Vermote indicated that more recent data would likely look greatly improved. There
are still some problems with the snow product, and incorporating clouds is proving to be
a real challenge. Currently he is using all the MODIS cloud data he can and filling it in
with GOES clouds at the poles and in the gaps between orbital passes. Still there are
some holes, and he is continuing to look for ways to get the clouds correct.
        Stockli indicated that the ocean product is 4.6 km at highest resolution, and he
wondered whether there was a higher resolution product available that he ought to be
using. Esaias commented that for these Ocean parameters, there is no need to go to a
higher resolution, and compositing the L2 (which is higher resolution) would produce
something that had no real meaning as it would require a patchwork of different days I
order to cover the whole globe. He said he was quite satisfied for the visualization to use
the 4.6 km. He suggested that SST would be a good parameter to include as well.

Stockli showed examples of the product, including an animation of a fly over of the Earth as well as the deployment of Aqua. The team commented that the visualizations looked very good.

Next the group moved back to the regular meeting room, and Jacques Descloitres presented on the current status of the MODIS Land Rapid Response (MLRR) System. He showed how the system was currently providing information on fire detection to the Remote Sensing Applications Center (RSAC) of the USDA Forest Service in Salt Lake City (http://www.fs.fed.us/eng/rsac/). He displayed a large map of the type that the agency uses at their daily fire briefings, on which they label all fires detected by MODIS. Several fires were printed on the map. Ultimately, the map will have a MODIS true-color image of the area as a background as well.

Esaias asked about the flow of data. Descloitres explained that Level 0 data comes from the NOAA bent-pipe stream to the MLRR. MLRR runs a corrected reflectance product (not Vermote's MOD09) and the fire detection algorithm. Those data are then sent to the University of Maryland, College Park, where Rob Sohlberg and crew package them up to be sent to the Forest Service in a format they like. This happens every day, so everyday at the morning fire briefing they have all fires detected by MODIS from the previous 24 hours. They cover the whole U.S. There is now a MODIS link on the National Interagency Fire Center (NIFC) web site (http://www.nifc.gov/firemaps.html), which Running commented was impressive. Descloitres advised the team of the MLRR web site (http://rapidfire.sci.gsfc.nasa.gov) and indicated that a NASA press release should be coming out soon.

Ramsay commented that when the NOAA contingent had gone out to NIFC to evaluate how remote sensing data was being used by them, they had discovered that the best use of the data seemed to be at the eleven regional sites, where fires are initially detected and where decisions are made about which fires need to have the most attention and resources devoted to them. NOAA is targeting those regional centers because their data is too coarse for specific fire management, but for the regional efforts, it is great. Ramsay mentioned network connectivity problems at some fire management sites and the inability to download the big image files. Running agreed, saying there is a big difference in capabilities across the different regional offices.

2.2 Instrument Configuration and Data Processing

Salomonson reported that we are waiting for Bob Evans to tell us about the noise on A-side, so we can decide how to proceed with data processing, and whether or not we need to think about switching back to B-side.

Salomonson initiated a discussion about data processing strategies. He said that it is becoming apparent that we should consider that we might have to do something that is less than everything, everywhere, every day. The team needs to discuss ways to get useful data out to the community in a timely manner, and he would like to approach the plan strategically from a science perspective, instead of being led by operation.

Among the ideas that have been discussed are cutting out products, and sampling spatially or temporally. Salomonson indicated that Masuoka and Robert Wolfe have preliminarily suggested that MODAPS does not save much production resources by reducing products. MODAPS configuration is better suited to producing all products

globally for selected time periods than it is for producing selected regions all the time. Salomonson indicated that sampling selected seasonal 32-day periods has been an idea he has explored. One point of difficulty is that Atmosphere and Oceans do better with global production of sampled time periods or lower resolution, whereas Land would be better off with full temporal resolution for sampled spatial regions. In general, however, it is hard to accept sampling in time for all disciplines.

There was some discussion, then, of decoupling the Land and Ocean/Atmosphere streams. Esaias added that because Oceans is so dependent on the instrument configuration, they are slower to respond to changes, and then MODAPS must either not produce Oceans products, or else they must produce bad data and then go back and reprocess after the Oceans code has been updated to reflect instrument changes. That would be another reason to decouple Oceans. Vermote pointed out that that might destabilize the system for a time, which is something we are trying to avoid.

Salomonson asked for thoughts and suggestions. Running said that there are some products that are explicitly time series products, and those products will unravel with this seasonal sampling approach. There is a definite drawback for those products. Salomonson said he expected that Land also wouldn't be satisfied with a lower resolution product. Running and Justice agreed. Esaias indicated that the point may be that they can't have exactly what they want, so they would need to decide what would be the next best thing to satisfy them.

Fleig commented that he wasn't sure that they still couldn't have full spatial and temporal resolution production. Salomonson said that we haven't seen yet that the system is capable of that. We have fallen from 60 days to 120 days behind.

Masuoka reported that on MTVS2 (the reprocessing stream) they have been able to keep up with DAAC, they are reprocessing the Ocean code with the updated code, and are essentially at the point where they are out of data to process. He believes they will 2x on MTVS2 soon. Salomonson indicated he was willing to wait for a bit to see what they were able to do. If MODAPS can finish March quickly, he would be willing to let them try to get April, and then reevaluate the strategy.

Justice asked whether, if we go to sampling mode, there is any realistic expectation that we could go back from that full processing all the time. Salomonson said that would be the hope, but we would have to see what the system was capable of. Masuoka commented that full data is coming in on MTVS 2, and they are at the point with algorithms where they don't have to keep remaking products. He thinks that now is the time to step on the gas, and get an accurate estimate of what the system can do.

Justice said that he couldn't agree with the sampling approach unless he could see the light of the end of the tunnel. If it is clear that we are never going to get to full production, then we will have to go back to square one and reconsider everything—cutting products, changing how they are produced, etc.

The group talked about whether we can ask for more resources, but Salomonson said he didn't think that it was very likely that any really significant additional resources can be expected. Fleig reiterated that he believes that MODAPS is capable of the 2x plus until Aqua launches, and a perhaps 1-2x more after that. Salomonson reiterated that we have no evidence yet that it is possible. Justice asked whether it would be possible to get the Project to forward fund the Aqua hardware, so we aren't getting hardware at the same

time as data. He said that the reality of the situation is that with Aqua coming, we don't have the capacity. We don't have a test system. If anything goes down, we are broken.

Salomonson said that he would like the discipline group leaders to think about strategies for processing, and that he would arrange a meeting for them to discuss them. One idea he considered was augmenting an SCF for the land production, and then sub-sampling the global stuff for Oceans and Atmosphere. Murphy said another approach might be to do the time-samples global production, and then do a continuous-time series for selected spatial regions. Vermote commented that Salomonson's seasonal-sample approach was a low-risk approach that shouldn't destabilize the system and would allow us to show off the best we can do right away.

In the meantime, MODAPS should finish up March, and when that happens Salomonson indicated that we would really advertise it. He has asked Masuoka to tell him 1.) when they are done with March, and 2.) when they are done with day 144-160, and then they will run April. When that is done, he will decide whether to go back to December or to perhaps do July. Murphy commented that in addition to day 192, we might want to look at a few days of "current" L2 down the road to keep an eye on the instrument.

Kempler indicated that they are putting in a patch for the problems they have been having at the DAAC, and if it works, they should be running smoothly soon. Esaias commented that he appreciated Kempler's position about not taking any more drops from ECS that haven't been tested properly, but was afraid Kempler may have backed off a bit. Kempler indicated that he had not, but he was making allowances for changes that needed to be made, such as security patches, and deliveries that the MODIS team wanted.

Esaias asked about HDF-EOS V. 5. Fleig said that no one will be forced to change to HDF-EOS V.5, and that no changes to MODAPS were planned that would force such a change.

2.3 Conclusion

Salomonson indicated that MAST was going to begin working on the Science Team Meeting agenda. He commented that Lindsey had suggested that we break the meeting up into theme-sessions focused on the five categories of research questions in the ESE research strategy (e.g., forcings, responses, prediction) and have people tailor their presentations around that. But he thought that might be too prescriptive, so he asked Lindsey to send out the agenda from the January meeting, and have folks comment on what changes they might like to see.

Esaias asked if there was any new news on the re-compete, and Salomonson said there was no new information, beyond the fact that the contracts will be extended for three months initially, and an additional three months beyond that if the recompetion process is delayed too long. Running commented that in the absence of any official documentation about that, he was unable to write contracts for his staff. Salomonson indicated that Conboy would look into the status of the contract modifications with the Procurement Office.

3.0 Action Items

3.1 Discipline leads to meet to resolve the issue of beta-release code and science-quality code, and what we need to say about it.

   Status: Open.

3.2 Technical team to discuss further the issue of predicted ephemeris data and how to improve it.

   Status: Open.